The computed tomography (CT) scan is a medical imaging procedure that uses x-rays and digital computer technology to create detailed two- or three-dimensional images of the body. Unlike other forms of medical imaging, the CT scan can make an image of every type of body structure at once, including bone, blood vessels and soft tissue.

The CT scanning equipment consists of a large gantry (a supporting structure) with a circular hole. Inside the gantry is a rotating ring that carries the x-ray source and electronic x-ray detectors. An attached table slides the fully reclined person into the hole.

Multiple x-ray projections are taken in thin cross-sections along the person’s body (imagine a loaf of sliced bread). The detectors collect the x-ray information from each cross-section and send them to a special computer that combines them into an image.

The CT scan may also be referred to by its older name of computed axial tomography or ‘CAT’ scan.

When a CT scan is used
Some of the common uses of the CT scan include:

- Assessment of a body part’s structure or shape
- Diagnosis of disease, particularly cancer
- Diagnosis of trauma or injury
- Diagnosis of vascular disease
- Aid to planning particular surgeries
- Aid to planning radiotherapy
- Visual aid to radiotherapy administration
- Visual aid to certain interventional procedures (going inside the body) such as biopsy or needle aspiration
- Measurement of bone strength
- Alternative to some types of exploratory or diagnostic surgery.

Medical issues to consider before a CT scan
Medical considerations prior to the CT scan may include:

- Tell the doctor if you are pregnant or think you may be pregnant. Another type of test may be recommended.
- Tell the doctor if you have allergies, diabetes, thyroid condition or renal (kidney) impairment.
- Tell the doctor if you experience claustrophobia (fear of small spaces). The doctor may give you mild sedatives to help you relax during the procedure.
- Tell the doctor about any implanted device you may have such as a pacemaker or medication pump, as metal objects may distort the images.
- Follow all the instructions you are given. Some CT scans require the use of contrast material to improve the
image quality. The contrast material may be taken orally or by an intravenous injection (or both).

- You may have to go without food and drink for a certain length of time before the procedure. Your doctor will give you detailed instructions on how to prepare for the test and what to expect.
- A very obese person may be too big for the circular hole of the CT machine. The doctor may advise another type of medical imaging or diagnostic test.

**CT scan procedure**

Generally, the procedure includes:

- You may be given a large drink to consume before the procedure. This drink is an oral contrast agent that helps to enhance pictures of the stomach, small intestines and bowel. In some cases, the contrast agent is administered as an enema.
- You will be asked to undress and wear a hospital gown. You must remove all metal objects including jewellery.
- You lie down on the scanner table. The radiographer may use straps and foam pillows to position your body and help keep you still.
- You may be given an intravenous injection of an iodinated contrast medium (a type of dye) to help produce better images. This substance may cause a strange warm feeling that lasts for a few seconds, a funny metallic taste in the mouth or the sensation that you have ‘wet’ yourself.
- The table slides into the circular hole in the machine.
- Depending on the body part and particular condition being investigated, a number of images may be taken as the table moves in and out of the circular hole.
- The gantry moves in a circle around you as it takes the x-ray images. Each revolution (turning) of the gantry takes less than a second and there may be a number of revolutions depending on the examination.
- Lie very still. This is very important, as movement will blur the images. You may be asked to hold your breath for a few seconds while the CT machine takes the images.
- The equipment makes clicks and buzzes while taking the images. Don’t be alarmed – this is normal.
- Depending on the type of medical investigation, the CT scan may take anywhere from a few minutes to half an hour or more.

**Immediately after the CT scan**

You may be asked to wait while the radiographer reviews the images. In some cases, more images must be taken. Once the radiographer has enough good images, you can dress and leave. The medically qualified radiologist assesses the scans. The results are usually sent to your referring doctor, so you will need to make a follow-up appointment.

**Complications of a CT scan**

The CT scan is a very safe procedure. Some people who have an injection of iodinated contrast material may feel nauseous for a short time afterwards. On rare occasions, a person may have an allergic reaction to this substance.

**Taking care of yourself at home after a CT scan**

The CT scan is a non-invasive, painless and relatively safe procedure that doesn’t require any recovery time. Be guided by your doctor but, generally speaking, you can resume normal activities as soon as you leave.

**Breastfeeding after a CT scan**

Nursing mothers may need to avoid breastfeeding for about 24 hours after a CT scan, if the iodinated intravenous dye was used. This is because some of the ingredients in the dye can pass into your breastmilk and may be passed on to your baby. Tell your doctor or radiologist that you are breastfeeding before your CT scan and ask what they recommend.

**Long-term outlook after a CT scan**

There are no known long-term side effects from having a CT scan. However, the procedure is thought to increase very slightly a person’s chance of developing cancer. To keep this small risk in perspective, a typical CT scan will expose you to the same amount of radiation that you would receive from the general environment over about three
Alternatives to a CT scan
Alternatives to a CT scan depend on the medical condition under investigation but could include:

- MRI scan
- Ultrasound
- Blood test
- Biopsy
- Exploratory surgery.

Where to get help
- Your doctor
- Radiographer or radiologist

Things to remember
- The CT scan is a medical imaging procedure that uses x-rays and digital computer technology to create detailed pictures of the body.
- It can image every type of body structure at once, including bone, blood vessels and soft tissue.
- The CT scan is a non-invasive, painless and relatively safe procedure that doesn’t require any recovery time.

This page has been produced in consultation with and approved by:
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